

CLAIMS

We Claim:

1 1. A method for removal of at least one target chemical from a region, comprising
2 the steps of:

3 adding a nanoparticle size bioparticle to said region, and

4 partitioning at least a portion of said at least one target chemical into or onto
5 said bioparticle, whereby the active concentration of said at least one target
6 chemical in said region is reduced.

1 2. The method of target chemical removal of claim 1, wherein said region is a
2 solution.

1 3. The method for target chemical removal of claim 1, wherein said partitioning
2 results substantially from differences in physicochemical properties between said
3 bioparticle and said at least one target chemical.

1 4. The method for target chemical removal of claim 1, wherein said partitioning
2 results substantially from adsorption of said target chemical on a surface of said
3 bioparticle.

1 5. The method for target chemical removal of claim 1, wherein said partitioning
2 results substantially from differences in physicochemical properties between said
3 bioparticle and said at least one target chemical and said partitioning results
4 substantially from adsorption of said target chemical on a surface of said
5 bioparticle.

1 6. A method for removal of at least one target chemical from a region,
2 comprising the steps of:

3 adding a nanoparticle size bioparticle having at least one enzyme
4 incorporated therein to said region, and

5 biotransforming at least a portion of said at least one target chemical into at
6 least one substantially inactive metabolite.

7 7. The method for removal of claim 6, wherein said region is a solution.

1 8. The method of removal of claim 6, wherein said at least one enzyme includes
2 genetically cloned enzymes.

1 9. A method for removal of at least one target chemical from a region,
2 comprising the steps of:

3 adding a bioparticle having at least one enzyme incorporated therein, and

partitioning at least a portion of said at least one target chemical into or onto
said bioparticle, wherein a portion of said at least one target chemical is
transformed into at least one substantially inactive metabolite.

10. The method for removal of claim 9, wherein said region is a solution.

11. The method for removal of claim 9, wherein said bioparticle is a nanoparticle.

12. The method for removal of claim 9, wherein said nanoparticle includes a
silica nanotube having an alkyl compound attached to said silica nanotube.

13. The method for removal of claim 9, wherein said bioparticle has a size from
approximately 1 to 100 nm.

14. The method for removal of claim 13, wherein said bioparticle has a size from
approximately 1 to 5 nm.

15. The method for removal of claim 9, wherein said at least one enzyme
includes genetically cloned enzymes.

1 16. A method for treating a patient exposed to a toxic drug, comprising the steps
2 of:

3 providing a plurality of nanosized bioparticles capable of mitigating the
4 effects of said toxic drug through at least one mechanism selected from the group
5 of mechanisms consisting of partitioning said toxic drug into or onto said bioparticle
6 and transforming said toxic drug into at least one substantially inactive metabolite,
7 and

8 introducing said plurality of bioparticles to said patient.

1 17. A method for treating an animal exposed to a toxic drug, comprising the
2 steps of:

3 providing a plurality of nanosized bioparticles capable of mitigating the
4 effects of said toxic drug through at least one mechanism selected from the group
5 of mechanisms consisting of partitioning said toxic drug into or onto said bioparticle
6 and transforming said toxic drug into at least one substantially inactive metabolite,
7 and

8 introducing said plurality of bioparticles to said animal.

1 18. A composition for detoxification, comprising:

2 a plurality of nanoparticles, said nanoparticles having at least one surface
3 adapted for toxic drug attachment, said nanoparticles being at least one selected
4 from the group consisting of microemulsions with nanoscale oil cores having soft

5 surface films, hydrophobic cores having porous or soft shells and hard surfaces for
6 specific adsorption of toxins.

1 19. The composition for detoxification of claim 18, further comprising attached
2 enzymes for chemically degrading toxins.

1 20. The composition for detoxification of claim 19, wherein said attached
2 enzymes includes genetically cloned enzymes.

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